

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
29 September 2005 (29.09.2005)

PCT

(10) International Publication Number
WO 2005/090903 A1

(51) International Patent Classification⁷:

G01B 11/04

(21) International Application Number:

PCT/AU2005/000406

(22) International Filing Date: 21 March 2005 (21.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

2004901438 19 March 2004 (19.03.2004) AU

(71) Applicant (for all designated States except US): **JRB ENGINEERING PTY LTD** [AU/AU]; 24 Drummond Street, West Perth, Western Australia 6005 (AU).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **BLAIR, Jim** [AU/AU]; 11 Langham Street, Nedlands, Western Australia 6009 (AU).

(74) Agent: **GRIFFITH HACK**; 256 Adelaide Terrace, Perth, Western Australia 6000 (AU).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

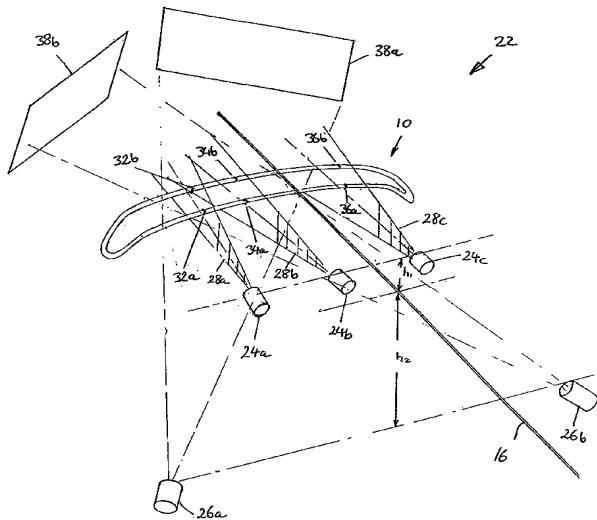
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CE, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: OPTICAL METHOD OF DETERMINING A PHYSICAL ATTRIBUTE OF A MOVING OBJECT



(57) Abstract: A method for optically determining a physical attribute of a moving object, such as the height h of the carbons (14) of a pantograph head (10). This method incorporates a method for optically establishing a mathematical spatial relationship between one or more cameras (26) and one or more fanned lasers (24) each capable of projecting a laser beam along a laser plane (28). The method comprises: establishing an orientation and location of each camera (26) with respect to a co-ordinate system; establishing an orientation of each laser plane (28) within the co-ordinate system; and deriving a transformation function for calculating the three dimensional position of points within the plane (28) of each respective laser beam from a pixel location within a pixelated image created by each of the cameras.

WO 2005/090903 A1